Montana Department of
ENVIRONMENTAL QUALITY

# WATERSHED MANAGEMENT Update

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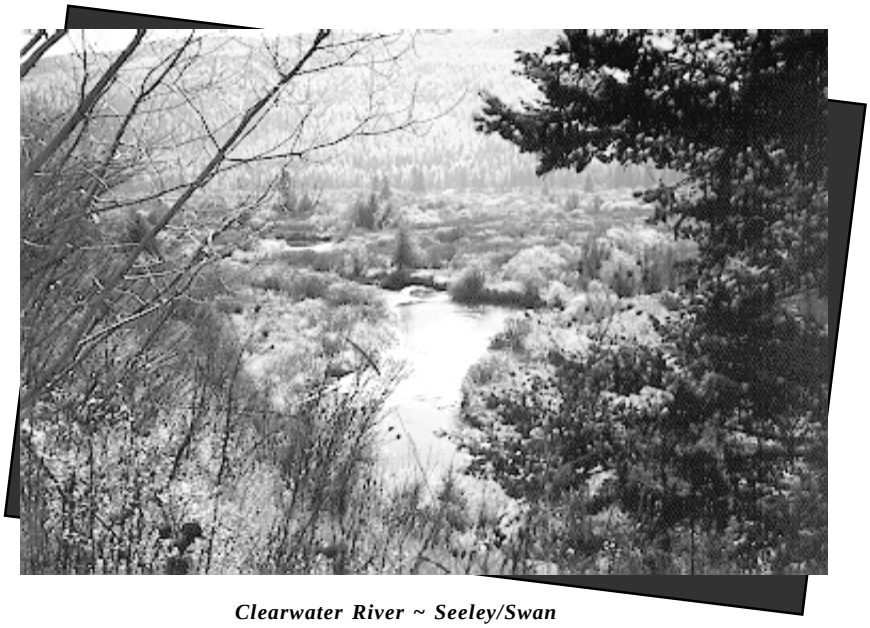
This newsletter is published by the Montana Department of Environmental Quality (DEQ) in an effort to share information with local watershed planning groups. Local groups are encouraged to share their success stories with others working in the westslope region to improve and protect water quality. To publish an article in the newsletter contact Roxann Lincoln at (406) 444-7423. The newsletter is now on the internet at http://www.deq.state.mt.us/ppa.index.htm.



*Clearwater River ~ Seeley/Swan*

> *"Rivers have what man most respects and longs for in his own life and thought -- a capacity for renewal and replenishment, continual energy, creativity, cleansing."*
>
> *John M. Kauffmann*
> *former American River Board Member*

## Teton River Watershed Group Completes Inventory of Teton River Basin

The Teton River Watershed Group, in cooperation with the Teton County and Choteau County conservation districts, has completed an inventory and assessment of the Teton River Basin. The inventory identified areas of noxious weed infestation, bare and eroded banks, salinity and other situations that affect stream health and water quality. In addition, the project developed an educational program to inform watershed residents about weed and water quality and quantity issues.

The project was funded with $15,000 from the Department of Natural Resources and Conservation (DNRC) Reclamation and Development Grant Program and contracted by the Department of Environmental Quality (DEQ). The project was completed in September 1998. The Teton River Watershed Group met on February 9, 1999 to evaluate the project and identified three major successes:

**Resource assessment** – Baseline data was acquired using aerial photos and a helicopter survey combined with satellite mapping. The data will be used to identify problems, suggest solutions and set priorities for future projects. The information will enhance the group's ability to apply and qualify for grant funds.

**Volunteer monitoring** – As a result of this project, the group set up a volunteer monitoring network. Residents along the river will monitor water quantity and quality. In addition, the USGS has reactivated several gauging stations on the Teton River.

**Information dissemination** – Information was distributed to adults and school children in the watershed. In the initial issue survey, over 80 percent of watershed residents responded. Also the group's events and public meetings were well attended. The group has put together a photo album of historic photos and before and after pictures of its projects. Signs were put up; newsletters, posters and brochures were distributed. Maps depicting the information gathered during the inventory are available for viewing at the Teton County Conservation District office in Choteau.

Special thanks went to Amy Fry and the Teton County Conservation District for administering the grant. If you would like more information on this or other projects of the Teton River Watershed Group, contact Alan Rollo at (406) 727-4437.

## MSU Studies Small Filter Strips

*Source: MSU Ag & Extension News*

**BOZEMAN** - Surveys show that producers know about vegetative filter and conservation buffers but are concerned about taking land out of production and the cost and difficulty of maintaining such strips.

MSU is still studying the cost and time involved in maintaining buffer strips, but research at Montana State University already shows that buffer strips do not have to be large to be effective. Using the right plants in the filter strips is one of the keys to effective nitrate filtering.

Since 1995, MSU has been evaluating four grass species for runoff control from confined livestock feeding and waste disposal facilities. They monitor the quality of runoff from livestock wastes (essentially manure piles) after water has passed through a managed filter strip of about 75 feet in length on a five percent slope of Bozeman silt loam soil. Each year they have imposed two independent flood irrigation events during the crop growing season and collected runoff water 75 feet down-slope from the manure stockpiles. In addition, they have monitored grass/forage production at various positions down-slope through the filter strip by harvesting at least twice during the growing season. Nitrate leaching is also monitored by detailed deep soil sampling.

The data suggests that an effective width for a vegetative filter strip may be as little as 10 feet. On vegetative filter strip plots, nitrate has not moved beyond two meters down-slope from the manure piles since the initial applications in 1995. Manure stockpiles have been replaced each spring with a new supply of manure. Essentially, the filter strips have effectively trapped nearly all of the nitrate that is contained in runoff originating from the manure piles within a planted width of three feet.

In those instances where nitrate has moved down-slope as part of the runoff directed through the filter strip, the maximum depth of nitrate leaching did not exceed 0.3 meter between the time of application and the sampling after irrigation where the strip was planted to grass. Only in the fallow strips did nitrate migrate below 0.5 meter depth, and only where manure was applied at the up-slope position was significant nitrate detected in the soil after irrigation.

Grass species vary in nitrogen uptake and yields. For instance:

| | | |
|---|---|---|
| ➢ Tall wheatgrass | 2.34% nitrogen (total) | 1354 lbs/acre |
| ➢ Meadow bromegrass | 2.08% nitrogen | 1493 lbs/acre |
| ➢ Tall fescue | 1.80% nitrogen | 1521 lbs/acre |
| ➢ Orchard grass | 1.50% nitrogen | 1278 lbs/acre |

The study has concluded thus far that vegetative filter strips provide an effective method for recovery of nitrate-nitrogen in runoff water from livestock waste piles. However, leaching of nitrate-nitrogen immediately below manure stockpiles seems to be a much more significant factor in affecting nitrate transport. On this particular study site, overland transport does not appear to be a significant problem in the presence of vegetative filter strips. However, nitrate accumulation in the soil profile does appear to be a significant event under noncropped, fallow sites.

For more information contact Jim Bauder at (406) 994-5685 or e-mail at jbauder@montana.edu.

## Photo Mapping Creates a Libby Creek Record

*By Ray Stout, The Western News*

For Patrick Lucey, a photo's not worth its thousand words if it can't convey the actual size of the stones, logs, riffles and other stream health indicators. Or if so, the kind of photographs he's

taking are worth more. "The problem with historical photos is that all you've got is a picture of a creek and trees, you have no idea if it's a small creek or a big creek," said Lucey, an aquatic ecologist based in Victoria, B.C.

But with new types of photos, taken same places different times, he'll see how much streambank has eroded, how much wood washed away and what plants replaced others, some essentials in monitoring the water's well being.

Lucey had brought two summer "e-teams," environmental youth teams organized by the B.C. Government to take the photos of Libby Creek.

*A healthy stream that meanders, but has stable banks.*

The two crews had come to field test the method recently developed by the U.S. Forest Service in Oregon. They'll compare their Libby Creek findings to their results from streams in Victoria and Cranbrook, B.C.

Eleven crew members rode down with Lucey and colleague Cori Barraclough for the three-day, two-night stay in or about Libby Creek.

The photos are standardized, guarded against visual distortion by camera features such as infinite focus and uniform lenses and f-stops. And with pictures taken at round, constant distances -- 5 meters from the signboard; 10 meters from the meterboard -- the photo offers reliable measurements directly off its surface.

Yet the method is "very inexpensive," Lucey said. The camera is low-tech and the film is black and white, which lasts longer than color, he said.

With mounted camera, the 16- to 24-year olds place an identifying signboard 5 meters into the stream at every site. The meterboard, at twice that distance, measures the depth.

But they don't just shoot the pictures anywhere. On Libby Creek, they used the state's metal survey benchmarks pounded into the banks at regular intervals.

Such consistency provides "a visual record of what this system looked like at this point in time," Lucey said.

The benchmarks are also where a Montana Conservation Corps crew -- the e-team's American counterpart -- has been measuring physical features such as depth, width and elevations on several creeks converging in Libby. That data will help map the floodplain for the state's fisheries managers.

Lucey shared this knowledge with the conservation corps members at the start of the three-day gathering organized by the Kootenai River Network, which fosters healthy communication about the drainage in British Columbia, Montana and Idaho.

Lucey's firm, Aqua-Tex Scientific Consulting and the B.C. Government, pay the e-teams while funding for the MCC crew comes from the Forest Service, Plum Creek Timber Co., the Montana Department of Fish, Wildlife and Parks and the Libby Area Conservancy District, a group dedicated to controlling flooding.

Lucey hopes the crews can do more work next year on both sides of the border. "We see tremendous opportunity here for interstate and various intergovernmental cooperation," he said.

And he'll have something to show for it as the technique gets refined. Pictures are much clearer than a bunch of words or data, said Barraclough.

"You can show them the photographs," she said. "And people understand that."

## EQIP Allocations

Bozeman - The USDA Natural Resources Conservation Service (NRCS) State Conservationist Shirley Gammon, with concur

rence from the USDA Farm Service Agency state committee, released on January 7, 1999 more than $4.6 million in 1999 Environmental Quality Incentives Program (EQIP) financial assistance allocations.

Sixty-five percent, $2,999,100, of the EQIP funds is designated to fund the seven priority areas across Montana listed below, and thirty-five percent of the funds, $1,614,000, will be designated for significant statewide resource concerns. National EQIP funding for 1999 is $174 million, which is a $26 million reduction from 1998 funding.

EQIP is a program of the 1996 Farm Bill and is one source of funding for locally led groups who have identified resource concerns and developed a plan to address those issues. Led by Conservation districts, many of these groups have applied for priority funding consideration. Input is obtained from agricultural groups throughout the state to develop the statewide resource concerns which are also prioritized for funding consideration.

In 1998, EQIP funds assisted producers in addressing the statewide natural resource concerns of improving grazing lands health, water quality and water quantity. For example, within the Sun River watershed conservation practices were installed on more than 10,000 acres to improve water quality and quantity.

Fiscal Year 1999 Funding

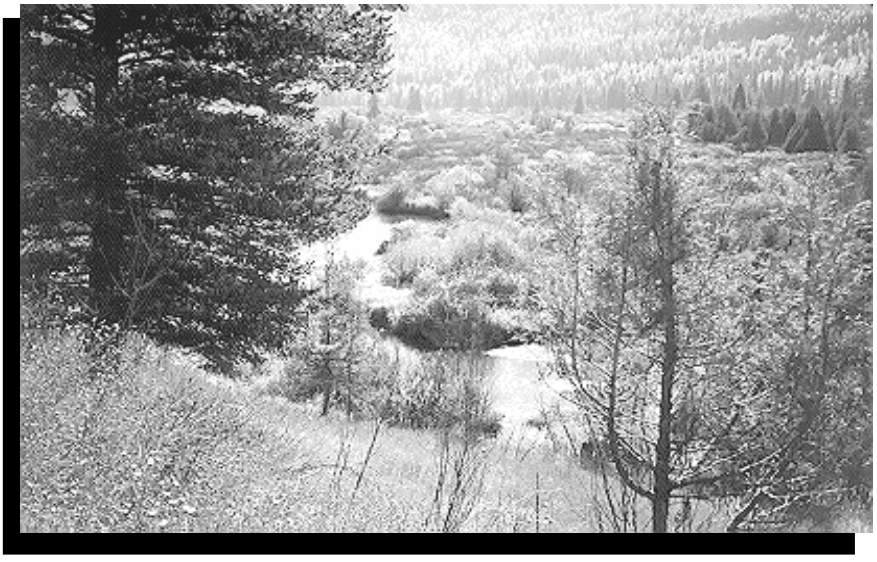
| | |
|---|---|
| Ruby River Watershed | $615,000 |
| Mosby/Musselshell River | $451,800 |
| Fort Peck Watershed | $540,040 |
| Sun River Watershed | $175,000 |
| Little Porcupine/Wolf Creek/ Buffalo Rapids | $827,910 |
| Two Medicine/Cut Bank Watershed | $389,350 |

“Improving Montanas natural resources through locally led work groups and conservation partnerships is the goal of the EQIP program,” said Gammon. “Financial, technical and educational assistance is being provided and conservation practices are being implemented to address these concerns. NRCS personnel are pleased to have the opportunity to provide local producers assistance in voluntarily conserving natural resources and improving agriculture production in Montana.”

To obtain more information on EQIP or the locally led process, contact your local USDA Service Center or conservation district located in the phone book under the United States Government.

**Conservation Tillage and Water Quality** from Conservation Technology Information Center Partners, Summer 1998, Vol. 16, No. 4.

More than 60 percent of producers know conservation tillage controls soil erosion but most of them still don’t make the connection with its water quality benefits.



*A stream with a stable dimension, pattern and profile.*

A recent nationwide survey of producers found few aware that conservation tillage (no-till, mulch-till, strip-till, and ridge-till) promotes water quality. The survey indicates that the water quality benefits of conservation tillage were recognized by only 15 percent of the producers who responded, despite considerable technical research which shows conservation tillage is highly effective for controlling runoff of phosphorus and other pollutants from farm fields.

“This is a clear indication that we still have work to do in educating producers about the benefits of conservation tillage and it’s obvious most producers aren’t aware of that yet.”

Research typically shows that various types of conservation tillage can reduce erosion and runoff by 50 percent or more. In addition, new research from the USDA Agricultural Research Service shows conservation tillage can also be beneficial for protecting groundwater from pesticide leaching by increasing the amount of carbon in the top layer of soil. ARS tells us this carbon, a by-product of the slow breakdown of crop residues on the soil surface, increases the soil's ability to retain herbicides, reducing the potential for leaching into groundwater.

As for the other conservation practices included in the survey - conservation buffers, crop nutrient management, and weed, insect and disease management - 36 percent or more of producers recognized water quality as a benefit of each.

Conservation tillage may be one more tool available to producers and watershed planning groups to improve water quality in a watershed.

| **Conservation Practice** | **Percent of farmers surveyed who mentioned...** | | |
|---|---|---|---|
| | ...one or more environmental benefit | ...less soil erosion | ...improved water quality |
| Conservation Tillage | 80 | 63 | 15 |
| Conservation Buffers | 87 | 64 | 47 |
| Crop Nutrient Management | 52 | - | 36 |
| Weed, Insect and Disease | 45 | - | 38 |

## Quotes from Connie Hatfield

**Quote No.1:** "One spring some environmentalists came to our ranch for a visit. We always have lots of birds on the ranch of all kinds, although I don't know all their names. The ducks are special favorites of mine. A woman from the Izaak Walton League asked how many baby ducks had been born on the ranch that spring. When I thought about it, I had to tell her that we hadn't had any babies this spring - or for a long time.

Well, she told me that our ducks were cinnamon teals, so I tried to find out what we needed to do to get baby ducks. After a lot of questioning and talking, we found out that cattle grazing by the water were disturbing the nests and all we needed to do was to keep them away from the riparian area during the nesting season.

The next spring - two families of baby ducks.

Following that we made other changes to our grazing practices and have enjoyed seeing baby ducks as well as many other wonderful improvements."

**Quote No.2:** "Sometimes people talk in such technical ways that it's hard to understand just what they are trying to say. Many ranchers around here aren't familiar with terms like "biodiversity," "sustainable ecosystems," or even "riparian area." We have had a lot of city environmentalists talk about what they want to accomplish, but it wasn't until a woman from Oregon Trout put it in clear terms that we all understood what they were talking about.

What she said was, "What I want to see are baby trees, teenage trees, middle age trees and old trees. And I want to see baby fish, teenage fish, middle age fish and old fish." "Yes," I said, "and I want to see baby ranchers, teenage ranchers, middle age ranchers and old ranchers." Finally it all made sense.

Connie Hatfield and her husband grew up on small rural acreages and have made their living from ranching for the past 20 years. They run 400 cows on 35,000 acres of private and public land near Brothers, Oregon. They spent 14 years in large animal veterinary practice. They have been actively involved for the past 9 years in finding solutions to grazing issues by working with environmentalists from the city.

## DEQ Activities Update

Bob Barry has been hired to fill the 305(b)/ 303(d) coordinator position for DEQ. Bob comes to the program from DEQ's

Permitting and Compliance Division where he was the project coordinator for the McDonald Gold Mine EIS. Bob has a BA in Psychology with a minor in Physical Sciences, a MA in Forest Management with a minor in Environmental Planning, and 61 hours of course work beyond his Master's in Natural Resource Policy. His background includes 12 years managing, organizing and communicating environmental assessment information.

Doug Foss has been hired to fill the Water Quality Modeling position within the Monitoring and Data Management Bureau. Doug's duties will be to primarily assist the TMDL coordinators with modeling applications. Doug comes to DEQ from Harza Engineering Company. Harza has extensive experience working with hydro projects ranging from the design and construction of many of the world's largest dams, the relicensing of hydroelectric installations, and other activities worldwide. Mr. Foss has been involved in various thermal and water quality modeling projects with Harza during the last five years including the Madison River thermal study. Doug has a B.S. in Mechanical Engineering from Montana State University.

DEQ monitoring staff are continuing the sufficient credible data reviews for streams on the 303(d) list. Streams in the following hydrologic unit codes (HUC) have been completed: The Upper Clark Fork River, The Lower Yellowstone, Little Missouri River, the Middle Missouri subbasins, Red Water, Judith, Arrow and Bullwhacker Dog HUCs.

Sufficient credible data reviews are near completion in the Upper Missouri River, Sage, Big Dry, Fort Peck Reservoir HUCs.

## Publications

1. *Riparian Forest Wildlife* (#EB146) explains why riparian forests are unique. They're a mix of water, cover and food, rarely found in other parts of the forest. Many wildlife species must have riparian forests to survive. Others use them seasonally, and still others use the riparian forest but also thrive in upland forests. One attraction is the diversity of plants found in the riparian forest, how those plants are arranged and the many food sources they provide.

This publication is available from the MSU Extension Publications for $5.00. Write to P.O. Box 172040, Bozeman, MT 59717 or call (406) 994-3274.

2. *Forest Ecosystem Stewardship* (#EB141) covers historic change in the landscape, ecosystem response to disturbance, biodiversity and sustainability. It includes examples of on-the-ground application of ecosystem science concepts. Topics include silviculture, reducing insect and disease outbreaks, growing big old trees, establishing linkages, reducing catastrophic fire, promoting structural and biodiversity in even-aged plantations and more.

This publication is also available from the MSU Extension Publications for $5.00.

3. *Extent, Magnitude, and Sources of Nitrate in the Flaxville and Underlying Aquifers, Fort Peck Indian Reservation, Northeastern Montana* by USGS

This report is now available for distribution and examines the relationship between extensive dryland agriculture and elevated concentrations of nitrate in water in the Flaxville and two underlying aquifers in the Fort Peck Indian Reservation.

For a copy write to U.S. Geological Survey, Branch of Information Services, Box 25286, Denver, CO 80225-0286 and request Water-Resources Investigations Report 98-4079.

4. *Guidelines for Interpretation of the Biological Effects of Selected Constituents in Biota, Water, and Sediment* November 1998

This book contains studies to identify and address irrigation-induced water quality and contamination problems associated with many projects in the Western States. Although the volume is targeted for scientific specialists, it may also be of interest to government officials, farmers, ranchers, conservationists, and anyone interested in the environmental health of freshwater ecosystems.

For a copy write to:

Manager, NIWQP(D-5010)
Bureau of Reclamation
P.O. Box 25007
Denver, CO 80225-0007

or visit their web site at: http://www.usbr.gov/niwqp

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